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Time course of UVA- and UVB-induced inflammation and hyperalgesia in human skin.

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Dose-dependency and time course of hyperalgesia and erythema following UVA (16.8 and 36 J/cm(2)) and UVB (one and three times the minimum erythema threshold) irradiation was investigated in 10 healthy human subjects. Skin patches (1.5 cm in diameter) on the ventral side of the upper leg were irradiated with UVA or UVB light. Hyperaemia (Laser Doppler flowmetry, infrared thermography), thermal hyperalgesia to radiant heat stimuli, and mechanical hyperalgesia to controlled impact stimuli were tested at 1, 6, 12, 24, 48 and 96 h after irradiation. Dose-dependent delayed hyperaemia and hyperalgesia was induced only by UVB irradiation. UVB-induced increase in blood flow peaked at 12 h after irradiation and normalized by 96 h. Although superficial blood flow, as measured by Laser Doppler flowmetry, increased up to eight-fold, no significant increase of skin temperature was detected using infrared thermography. Development of mechanical and thermal hyperalgesia was delayed and reached a plateau between 24 and 48 h. In contrast to UVB, UVA irradiation of up to 36 J/cm(2), sufficient to produce intense tanning of the skin, did not induce significant hyperalgesia or delayed hyperaemia. It is concluded that UVB- but not UVA-irradiation is a suitable experimental model of subacute thermal and mechanical hyperalgesia. The different time courses of erythema and hyperalgesia indicate that inflammatory mediators responsible for vasodilatation are not identical with those inducing hyperalgesia. Copyright 1999 European Federation of Chapters of the International Association for the Study of Pain.

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